



# Rural vs. Urban Ambulatory Health Care: A Systematic Review

**EXECUTIVE REPORT**

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## PREFACE

Health Services Research & Development Service's (HSR&D's) Evidence-based Synthesis Program (ESP) was established to provide timely and accurate syntheses of targeted healthcare topics of particular importance to Veterans Affairs (VA) managers and policymakers, as they work to improve the health and healthcare of Veterans. The ESP disseminates these reports throughout VA.

HSR&D provides funding for four ESP Centers and each Center has an active VA affiliation. The ESP Centers generate evidence syntheses on important clinical practice topics, and these reports help:

- develop clinical policies informed by evidence,
- guide the implementation of effective services to improve patient outcomes and to support VA clinical practice guidelines and performance measures, and
- set the direction for future research to address gaps in clinical knowledge.

In 2009, the ESP Coordinating Center was created to expand the capacity of HSR&D Central Office and the four ESP sites by developing and maintaining program processes. In addition, the Center established a Steering Committee comprised of HSR&D field-based investigators, VA Patient Care Services, Office of Quality and Performance, and Veterans Integrated Service Networks (VISN) Clinical Management Officers. The Steering Committee provides program oversight, guides strategic planning, coordinates dissemination activities, and develops collaborations with VA leadership to identify new ESP topics of importance to Veterans and the VA healthcare system.

Comments on this evidence report are welcome and can be sent to Nicole Floyd, ESP Coordinating Center Program Manager, at [nicole.floyd@va.gov](mailto:nicole.floyd@va.gov).

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## EXECUTIVE SUMMARY

### BACKGROUND

Approximately 3 million veterans, slightly more than one-third of all veterans enrolled in the Department of Veterans Affairs (VA) health care system, live in rural areas. This pattern is likely to continue, as a comparable proportion of Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) veterans are from rural areas. The Rural Veterans Care Act of 2006 was signed into law to improve care for rural veterans. Ensuring that the health care needs of rural veterans are met has become a top priority for VA, resulting in a considerable expansion of community based outpatient clinics (CBOCs), inclusion of rural health/access as a research priority, and creation of the VA Office of Rural Health (ORH) in 2006.

Although there have been reports comparing health quality of life (both physical and mental) for rural and urban veterans, it remains unclear whether the observed lower health quality of life in rural veterans is due to disparities in health care, differences in disease prevalence, or other population differences. This systematic review examines the evidence regarding potential disparities between rural and urban areas in health care provision and delivery, and how differences in health care may contribute to disparities in health outcomes. Differences in rural-urban prevalence rates of diseases and other health conditions are beyond the scope of this review. Because veterans who use VA health care have been found to use more non-VA health care overall, we expanded the focus of this review to include comparisons of rural vs. urban health care in non-VA health systems.

The key questions were:

Key Question #1. Do adults with health care needs who live in rural areas have different intermediate (e.g., hemoglobin A1c [HbA1c], Blood pressure, etc.) or final health outcomes (i.e., mortality, morbidity, quality of life [QOL]) than those living in urban areas?

Key Question #2. Is the structure (e.g., types of available providers) or the process (e.g., likelihood of referral) of health care different for adults with health care needs who live in urban vs. rural environments?

Key Question #3. If there are differences in the structure or the process of health care in rural vs. urban environments, do those differences contribute to variation in overall or intermediate health outcomes for adults with health care needs?

Key Question #4. If there are differences in intermediate or final health outcomes for adult patients with health care needs, what other systems factors moderate those differences (e.g., availability of specialists, type of treatment needed, travel distance)?

### METHODS

We searched OVID MEDLINE, PsycINFO, and CINAHL, using search terms related to rural health and rural health services, for clinical trials of adult patients in the United States, published in English language, between 1990 and June, 2010. Titles and abstracts were reviewed by the authors using pre-defined exclusion criteria. Additional articles were identified by searching

reference lists from relevant publications and from a search of the contents of *The Journal of Rural Health*. Study design, sample characteristic, data source, analysis, and outcome measure data were abstracted by the authors, all of whom have experience in critical analysis of the literature and who were trained on the use of the abstraction form created for this review. We created evidence tables and compiled a summary of findings for each clinical topic, and drew conclusions based on a qualitative synthesis of the findings.

## DATA SYNTHESIS

Because we wished to examine the body of evidence related to specific areas of health care, the studies were reviewed with other studies in that area. We constructed evidence tables showing the study characteristics and results for all included studies. We critically analyzed studies to compare their characteristics, methods, and findings. We compiled a summary of findings for each clinical topic, and drew conclusions based on a qualitative synthesis of the findings.

## PEER REVIEW

A draft version of this report was reviewed by nine technical experts, as well as clinical leadership. Reviewer comments were addressed and our responses were incorporated in the final report (Appendix B).

## RESULTS

We screened 1,381 unique titles and abstracts, rejected 1,048, and performed a more detailed review on 333 articles. We excluded an additional 165 articles and added 24 articles through hand-searching of references lists and *The Journal of Rural Health*. We excluded 93 articles that were not related to ambulatory care, were studies of interventions, or were useful only for background information. Three studies were added after peer-review resulting in 102 studies that reported outcomes related to one of the key questions.

The identified evidence has been presented under the following headings: preventive care/ ambulatory care sensitive conditions (ACSCs), cancer care, diabetes/end stage renal disease (ESRD), cardiovascular disease, HIV/AIDS, neurologic conditions, and mental health. We also identified and presented research focused on medication use, medical procedures and tests, and provider and service utilization more generally. There are large gaps in the evidence base across clinical conditions, and minimal empirical work conducted on several areas of particular interest to the VA (e.g., traumatic brain injury, post-traumatic stress disorder, Hepatitis C).

Of the areas in which there were studies, the overall evidence base was fairly weak. In addition to a limited number of studies in most areas, only one study used a prospective design, and few linked health care differences with health outcomes. Moreover, while very large databases are needed to adequately examine many aspects of rural vs. urban health care, studies that relied on existing national or state databases were limited by the covariates available in those databases. Definitions of rural and urban vary across studies making interpretations and comparisons of findings difficult. Furthermore, many studies treated correlates of urban and rural settings as confounders and adjusted for these factors in statistical models, effectively controlling for the very factors that might underlie a potential disparity.

**Key Question #1. Do adults with health care needs who live in rural areas have different intermediate (e.g., HbA1c, Blood pressure, etc.) or final health outcomes (i.e., mortality, morbidity, QOL) than those living in urban areas?**

We identified some evidence of a health care disparity for the following conditions: suicide rates, hospitalization for ACSCs, stage of cancer presentation, and ESRD. Available evidence suggests that there is no disparity in diabetes care, the prevalence of ESRD, or control of hypertension.

**Key Question #2. Is the structure (e.g., types of available providers) or the process (e.g., likelihood of referral) of health care different for adults with health care needs who live in urban vs. rural environments?**

Urban residents tended to receive more medications but the evidence was limited. There were no consistent differences in the receipt of or adherence to medication. Office visits, medical procedures, and diagnostic tests were less frequent in rural settings, with consistently lower screening rates for breast and cervical cancer. In rural areas, cancers were more likely to be unstaged at the time of diagnosis. Rural residents were less likely to see medical specialists, including mental health specialists, and the availability of medical specialists is particularly limited in rural areas. Although rural residents were as likely as urban residents to have a usual source of care (i.e., a particular clinic), rural residents were more likely to have better continuity of care with a specific provider. Highly rural areas have an insufficient supply of health care providers, and are more likely to rely on physician extenders for primary care.

Data on quality of care were only available for a few conditions, with some evidence suggesting lower quality of care in rural areas for patients with HIV or cancer, but findings were less consistent for the treatment of depression.

**Key Question #3. If there are differences in the structure or the process of health care in rural vs. urban environments, do those differences contribute to variation in overall or intermediate health outcomes for adults with health care needs?**

Although many studies document differences in health care structure or processes, very few studies associated these differences with variation in health outcomes. Among the limited findings were higher rates of invasive cervical and breast cancers associated with lower screening rates in rural areas, improved adherence to guideline care for diabetes treatment (associated with improved access to rural health clinics), higher rates of suicide in rural areas associated with differential use of antidepressants (especially older antidepressants), and better continuity of care associated with fewer providers in rural areas.

**Key Question #4. If there are differences in intermediate or final health outcomes for adult patients with health care needs, what other systems factors moderate those differences (e.g., type of treatment needed, travel distance)?**

Other factors identified include insurance, travel distance, patient attitudes, and race disparities.

**FUTURE RESEARCH**

There are many gaps in the existing research. Several important clinical conditions have not been addressed, and few studies have enrolled veterans. A key issue for future research is the

choice of definitions for rural and urban areas. Researchers should provide a rationale for why a particular definition was chosen and consider using more than one definition and reporting all results. Many factors are correlated with rurality, and adjusting for all available covariates may lead to false conclusions regarding the association of rurality and study outcomes and provide insufficient information for the development of healthcare policy. For most research questions, a more contextual analytic approach should be used.

Accordingly, statistical methods should be clearly defined and researchers should report bivariate associations between rurality and study outcomes in addition to the results of multivariate models. Specific examination of rurality and race (and/or income) should be considered when appropriate, as should potential regional differences in rural-urban healthcare disparities.

Future research should move beyond documentation of differences between urban and rural health care and determine whether such differences lead to disparities in health outcomes. Studies examining health care for conditions requiring specialists or subspecialists should consider whether rural residents seek such treatment in local vs. urban settings. Across studies on rural vs. urban healthcare, prospective designs are greatly underutilized which significantly limits the strength of the evidence base.